BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AFMS 38AJ
6 October 1995

Manpower Standard

★*TELEPHONE SWITCHING SYSTEMS MAINTENANCE - INSIDE PLANT SECTION*

★This Air Force Manpower Standard (AFMS) quantifies the manpower required to maintain the Telephone Central Office Switch to provide command and control and administrative telephone service for the objective wing, including all active duty military, Air National Guard, Reserve, Department of Defense, and nonappropriated fund organizations. The Telephone Inside Plant Section is responsible for maintenance of telephone switching centers, cable records, distribution frames, and other inside plant equipment. The 21 series of Air Force Instructions (AFIs) contains responsibilities, policy, and procedural guidance for the Telephone Inside Plant section. This AFMS was developed in accordance with policy and procedures contained in AFMAN 38-208, *Air Force Management Engineering Program (MEP).* This section applies to all objective wing Telephone Inside Plant Elements in AMC, ACC, USAFE, PACAF, and AETC Undergraduate Pilot Training (UPT) bases during peacetime. It does not apply to Air National Guard, Air Force Reserve installations, Combat Communications units, or units that have undergone cost comparison studies. Both a positive and a negative variance must be developed for all work within the organization that has undergone a cost comparison study. Send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through channels, to AFMEA/AEDA, 550 E Street East, Randolph AFB, Texas 78150-4451.

★*SUMMARY OF CHANGES*

This AFMS is updated to implement format changes to comply with SAF requirements. It includes minor administrative changes in the overall layout of the AFMS and renumbering of all paragraphs. It revises the equation in paragraph 6.1 in the manuscript. Changes are identified with a ★.

1. Core Composition. The following factors were considered to determine the core manpower required for Telephone Inside Plant Maintenance:

1.1. **Plant Equipment Requirements.** An objective wing population of 3,055, 72 Primary Aircraft Assigned, located on a base comprising 3,500 acres, assumes a flying mission. To support this mission, a digital telephone switching system (DMS-100, MSL-100, or GTD-4600) with 1,632 official telephone numbers (includes class B telephones for overseas locations), 173 trunks providing Defense Switched Network (DSN) and commercial local and long distance service is needed, and 916 nonswitched circuits are in use.

1.2. **Level of Service.** The level of service provided to support wing flying hours of 16 hours per day, 7 days per week, is single-shift maintenance of 40 hours per week, plus on-call maintenance for unscheduled outages.

1.3. **Restoral Priorities.** Restoral priorities will be established and followed when personnel respond to multiple outages.

1.4. **Indirect Work.** Indirect work involves those tasks that are not readily identifiable with the work center's specific product or service. The major categories of standard indirect work are Supervision, Administration, Meetings, Training, Supply, Equipment Maintenance, and Cleanup. See AFMS OOAA for the standard indirect description. Core man-hours for indirect work are computed in with the processes.

Supersedes AFMS 38AJ, 11 August 1994
OPR: AFMEA/AEDA (Mr. Glen Craft)

Certified by: AFMEA/AED (Lt Col Terry Holtz)
Pages: 11/Distribution: F

1.5. **Core Manpower Required.** 4

1.6. **Core Range.** 2-22 authorizations, that support a maximum population of 50,000 people.

1.7. **Programming Factor.** Line Equipment Numbers.

2. Core Composition Variables. The following factors need to be considered to determine changes to the core composition.

2.1. Increased authorizations in wing population are assumed to support an increase of aircraft assigned. These increases are also assumed to increase at a rate of 24 aircraft and their associated manpower at a time. Incremental increases in numbers of aircraft will generate an increase in wing population that requires official telephone numbers. This will require additional manpower to support this increase of wing population.

2.2. Other increases to wing population that are not aligned with the wing's original mission, support and flying of 72 Primary Aircraft Assigned, will be handled as a variance.

3. Standard Data:

3.1. **Approval Date.** 1 March 1993

3.2. **Man-hour Data Source.** Workshop Measurement

3.3. **Man-hour Equation.** Yc = 407.599 + .1045165X

3.4. **Workload Factor:**
3.4.1. **Title.** Line Equipment Number (LEN) assigned in software.
3.4.2. **Definition.** The number of LENs (official telephone numbers in use) maintained by the element.
3.4.3. **Source.** Central Office records that are maintained by unit Telephone Inside Plant Maintenance personnel. Advise the switch technician to count one for each LEN/line assigned in the system software.
3.5. **Points of Contact:**
3.5.1. **Functional Representatives.** CMSgt Robinson and SMSgt Corley (AFC4A/SYVS).
3.5.2. **AFMEA Representative.** Mr. Glen Craft (AFMEA/AEDA), DSN 487-2479.

4. Application Instructions for Core Equipment in Government-Maintained Plant.

4.1. **Step 1.** Determine Line Equipment Number (LENs) count.

4.2. **Step 2.** If you have the DMS 100, MSL-100, or GTD-4600 switch, substitute your LENs count for "X" in the standard equation (reference paragraph 3.3 above).

4.3. **Step 3.** Determine any other variance man-hours applicable to the above switch (reference Attachment 3, Variances A3.4 through A3.7).

4.4. **Step 4.** Add/Subtract the man-hours obtained in Step 3 to the man-hours obtained from Step 2.

4.5. **Determining Manpower Requirements.** Divide the resulting man-hours by the appropriate man-hour availability factor (MAF) and overload factor. Use current rounding rules to determine whole manpower requirements.

5. Application Instructions for Variance Equipment in Government-Maintained Plant:

5.1. **Step 1.**
5.1.1. If you have the electro mechanical switch, substitute your LENs count for "X" in the man-hour equation for the electro mechanical variance (reference Attachment 3, paragraph A3.2).
5.1.2. If you have the KNS-4100, SYSTEM 85, or SL-1 switch, substitute your LENs count for "X" in the man-hour equation for the KNS-4100 variance (reference Attachment 3, paragraph A3.2).
5.1.3. If you have the DMS 100/200 multi-function switch, substitute your LENs count for "X" in the man-hour equation for the multi-function variance (reference Attachment 3, paragraph A3.3).

5.2. **Step 2.** Determine any other variance man-hours applicable to the variance switch (reference Attachment 3, Variances A3.4 through A3.7).

5.3. **Step 3.** Add/Subtract the man-hours obtained in Step 2 to the man-hours obtained in Step 1.

5.4. **Determining Manpower Requirements.** Divide the resulting man-hours by the appropriate MAF and overload factor. Use current rounding rules to determine whole manpower requirements.

6. Application Instructions for Contractor-Maintained, Government-Owned Plant:

★6.1. **Use the following equation.** Yc = 1 (for QAE) + 1 (if you have BMS).

6.2. **The following manpower description is for Plant Management:**

6.2.1. **PERFORMS SYSTEM ADMINISTRATION FOR THE BIDDS MANAGEMENT SUBSYSTEM (BMS).** Maintains the UNIX operating system; performs system start-up and shut-down; files system backup and recovery; maintains file system integrity and free space; changes configuration files for: adding/removing user accounts, activating or deactivating access port, setup and maintenance of communications capability, setup and maintenance of the line printer system, and start-up/shut scripts; initiates file to run commands at selected times; monitors system accounting and activity; balances user needs; reads root main; teaches UNIX basics; establishes/maintains security; installs hardware and software; purchases supplies/equipment; and corrects system problems/errors.

6.2.2. **PERFORMS CONTRACT QUALITY ASSURANCE EVALUATOR (QAE) DUTY.** Prepares QAE nomination letter and forwards it to servicing contracting office; performs contract surveillance by reviewing and interpreting each duty/service as defined in contract; evaluates contractor performance to determine if service is acceptable; and reports deficiency in contractor performance to servicing contracting officer, and documents deficiency.

7. Statement of Conditions. This function has no environmental conditions that impact the work center's ability to perform work identified in the Element Description.

BENJAMIN N. CHAPMAN, Lt Col, USAF
Chief, Plans & Productivity Division

Attachments
1. Element Description
2. Standard Manpower Table
3. Variances
4. Process Analysis Summary

ELEMENT DESCRIPTION

TELEPHONE SWITCHING SYSTEMS MAINTENANCE - INSIDE PLANT SECTION

A1.1. RESPONDS TO AURAL AND PRINTED SYSTEM STATUS ALARM. Identifies alarm, classifies alarm, determines fix action, notifies repair agency, documents action taken, and performs required follow-up action.

A1.2. PRELIMINARY TROUBLESHOOTING. Receives notification of trouble, performs preliminary troubleshooting, documents trouble, obtains test equipment, tests equipment/circuit, isolates to subsystem, notifies repair agency, turns in test equipment, documents action taken, and performs follow-up action.

A1.3. REPAIRS SYSTEM HARDWARE AND SOFTWARE FAULT, SYSTEMS TRANSLATION, END-OFFICE TRUNK, CIRCUIT, AND ASSOCIATED EQUIPMENT. Receives log report or documented trouble report, obtains tools and material, logs onto system, tests hardware/software/equipment, isolates to circuit pack, adjusts/removes/replaces hardware/equipment, tests translation, isolates to table, makes routing change, tests trunk/circuit, isolates to subsystem, opens trouble ticket, notifies appropriate agency, notifies contractor, opens Customer Service Request (CSR), coordinates software change, closes CSR, logs off system, turns in tools and material, turns in defective circuit pack, and documents repair.

A1.4. MONITORS AND ANALYZES SYSTEM REPORTS/STATUS PANEL. Receives log report, initiates CSR, notifies contractor, determines fix action, reviews CSR, and documents action taken. Assigns report, thresholds/suppresses report, assigns device, collects report, analyzes report/status panel, identifies inconsistency, documents action, and performs required follow-up action.

A1.5. UPDATES SYSTEM DATABASE AND SOFTWARE, ASSIGNS LINES AND FEATURES. Receives requirement from contractor, validates request, builds hardware mock-up, develops routing, inputs data in table, verifies input, tests translation, receives Preengineered AUTOVON Restoral (PAR) Plan change, validates change, executes plan, receives notification of new system feature from contractor, researches change, coordinates change, receives load change documentation, reviews documentation, verifies change in load, notifies appropriate agency, freezes database, provides copy to contractor, takes image, applies load, activates new load, tests new load, schedules downtime, coordinates download, mounts tape, monitors switch during load, synchronizes processor, changes on-line processor, matches database, receives work order or telecommunications service order (TSO), researches request, determines feature compatibility, coordinates with requester, authorizes/denies access, determines protocol, assigns identification, inputs privilege class, activates port, establishes requirement, develops format, collects data, writes file, opens/changes/ deletes file, inputs data, saves file, notifies affected agency, and documents action taken.

A1.6. PREPARES REPORTS. Receives request, researches request, coordinates with requester, develops format, assigns device, starts/stops report, extracts data, reviews report, compiles report, delivers product, defines equipment, assigns class, sets schedule, collects data, analyzes data, delivers report to appropriate agency, defines requirement, accesses database/file, extracts data, and documents action taken.

A1.7. INSTALLS A VOICE/SPECIAL/DATA CIRCUIT OR END-OFFICE TRUNK. Receives work order or TSO, logs onto system, establishes routing, logs off system, obtains tools and test equipment, runs jumper, tests circuit/trunk, notifies installer/distant end, tests circuit, turns in tools and test equipment, documents work order, and turns in work order.

A1.8. REMOVES A VOICE/SPECIAL/DATA CIRCUIT OR END-OFFICE TRUNK. Receives work order or TSO, obtains tools, coordinates with agency, removes jumper, logs onto system, deletes routing, logs off system, returns tools, documents work order, and turns in work order.

A1.9. MAINTAINS MANUAL RECORDS AND REPORT. Receives request or trouble call; documents receipt; selects service, searches for record; locates record; tests circuit; opens trouble log; enters data on cut sheet, trouble ticket, or special form; files record; documents work order; files copy; receives notification of completed action;

coordinates with installer; notifies customer; receives trouble ticket from installer; closes out trouble ticket; closes out trouble log entry; notifies Maintenance Control; files trouble ticket; files trouble log; locates record; provides data; returns record; selects circuit number; selects cable pair; annotates new record; removes data from records; files record in dead file; and forwards report to using agency.

A1.10. RECEIVES AND SHIPS SPARE SYSTEM CIRCUIT CARDS. Receives notification of spare arrival, picks up spare, inspects condition of package, documents receipt, verifies part number, hot-checks spare, verifies physical condition of spare, packages spare for shipment, coordinates with contractor, places spare in shipment, and updates inventory document.

A1.11. PERFORMS VICINITY TRAVEL. Coordinates for travel to work site, travels to work site, coordinates for travel to work center, and returns to work center.

A1.12. PERFORMS PREVENTIVE MAINTENANCE INSPECTIONS (PMI). Picks up documentation; reviews PMI procedure; obtains tools, test equipment, and materials; dons safety equipment; prepares work site; sets up test equipment; visually inspects equipment; coordinates with appropriate agency; performs test; observes reading or malfunction; makes minor adjustment; returns equipment for use; documents problem in maintenance log; completes PMI documentation; cleans work site; coordinates completed action with appropriate agency; and turns in tools, test equipment, materials, and documentation.

STANDARD MANPOWER TABLE

WORK CENTER/FAC			**APPLICABILITY MAN-HOUR RANGE**								
Multi-Function/Digital Telephone Switch Maintenance/38AJ			321.40 - 3353.4								
AIR FORCE SPECIALTY TITLE	**AFSC**	**GRADE**	**MANPOWER REQUIREMENT**								
Tele Switching Crftmn	2E771	MSG							1	1	1
Tele Switching Crftmn	2E771	TSG	*	1	1	1	1	1	1	1	1
Tele Switching Jrnymn	2E751	SSG	1	1	1	1	2	2	2	2	2
Tele Switching Jrnymn	2E751	SRA	1	1	2	2	2	2	2	2	3
Tele Switching Apr	2E731	A1C				1	1	2	2	3	3
TOTAL			2	3	4	5	6	7	8	9	10
AIR FORCE SPECIALTY TITLE	**AFSC**	**GRADE**	**MANPOWER REQUIREMENT**								
Tele Switching Crftmn	2E771	MSG	1	1	1	1	1	1	1	1	1
Tele Switching Crftmn	2E771	TSG	1	1	1	1	2	2	2	2	2
Tele Switching Jrnymn	2E751	SSG	3	3	3	4	4	4	4	5	5
Tele Switching Jrnymn	2E751	SRA	3	3	4	4	4	4	5	5	5
Tele Switching Apr	2E731	A1C	3	4	4	4	4	5	5	5	6
* ***NOTE:*** If the plant is contractor maintained, then the manpower equals one TSgt and one SSgt.											
TOTAL			11	12	13	14	15	16	17	18	19

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STANDARD MANPOWER TABLE											
WORK CENTER/FAC			**APPLICABILITY MAN-HOUR RANGE**								
Multi-Function/Digital Telephone Switch Maintenance/38AJ			321.40 - 3353.4								
AIR FORCE SPECIALTY TITLE	**AFSC**	**GRADE**	**MANPOWER REQUIREMENT**								
Tele Switching Crftmn	2E771	MSG	1	1	1						
Tele Switching Crftmn	2E771	TSG	2	3	3						
Tele Switching Jrnymn	2E751	SSG	5	5	6						
Tele Switching Jrnymn	2E751	SRA	6	6	6						
Tele Switching Apr	2E731	A1C	6	6	6						
TOTAL			20	21	22						
AIR FORCE SPECIALTY TITLE	**AFSC**	**GRADE**	**MANPOWER REQUIREMENT**								
TOTAL											

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VARIANCES

TELEPHONE SWITCHING SYSTEMS MAINTENANCE - INSIDE PLANT SECTION

A3.1. Title. Positive Technological Variance for Electro Mechanical Switch.

A3.1.1. **Definition.** Prepares and maintains telephone plant records including, but not limited to, local communications service order, telephone trouble record, number assignment record, circuit layout record and communications-electronics facility record. Receives and records telephone trouble call and cable outage; performs isolation test to determine the probable source of trouble; notifies maintenance control of trouble for dispatch of technician(s) to restore telephone/cable service; coordinates with commercial agencies, circuit control stations, subscribers and workload control for testing and restoration of non-TAC radio net cables, long-line voice cables and teletype and data transmission cables. Uses test equipment and devices to perform operational/functional tests and electro mechanical/ mechanical adjustments and/or repair of telephone line finders, selectors, connectors, repeaters, DSN precedence trunks, circuit plates, alarms, switchboard/attendants cabinets and ringing and tone interrupter equipment; performs operational check of emergency power generating equipment; performs bench check of telephone equipment/components; performs visual inspection of main/intermediate distribution frame (MDF/IDF), switchboard key shelves, storage batteries, power distribution panels, and rectifier controls; and completes MDF customer service connect/disconnect.

A3.1.2. **Impact.** +294.388 Man-hours (1.832 Fractional Manpower).

A3.1.3. **Applicability.** This variance applies to those locations with an Electro Mechanical Switch instead of the DMS 100. Use the following man-hour equation instead of the DMS 100 man-hour equation.

Yc = 531.39 + .20903299X
Where "X" equals the LENs count.

A3.2. Title. Positive and Negative Technological Variance for KNS-4100 (ETS) Switch.

A3.2.1. **Definition**. Repairs, installs, removes, assigns, changes routing of, or performs PMI for a circuit, trunk, or equipment. Receives work order or TSO, coordinates with requester, obtains tools and test equipment, runs jumper, logs on to system, inputs data, verifies input, establishes/changes routing/ translations, activates port, logs off system, tests circuit/trunk/equipment, notifies distant end, turns in tools and test equipment, documents work order, turns in work order, receives log report or documented trouble report, isolates to subsystem, opens trouble ticket, notifies appropriate agency, adjusts or replaces hardware, closes trouble ticket, files trouble ticket; picks up documentation and reviews PMI, quality control check sheet or work card for required inspection; notifies maintenance control of anticipated action, requests equipment release, sets up test equipment, visually inspects equipment; coordinates with appropriate agency, and performs test; observes reading or malfunction, makes minor adjustment, returns equipment to use, and documents problem in maintenance log; assists Quality Control (QC) in performance of technical or special inspection of the work center/work site to identify administrative, managerial or technical problems; and documents action taken.

A3.2.2. **Impact.** -16.36 man-hours (-.102 manpower).

A3.2.3. **Applicability.** This variance applies to those locations with a KNS 4100, system 85, or SL-1 Switch instead of the DMS 100. Use the following man-hour equation instead of the DMS 100 man-hour equation.

Yc = 246.870 + .23083327X
Where "X" equals LENs count.

A3.3. Title. Positive Technological Variance for DMS 100/200 Multi- Function Switch.

A3.3.1. **Definition**. Repairs, installs, removes, assigns, changes routing of, or performs PMI for a DSN trunk (MULTI-FUNCTION ONLY). Receives work order or TSO, verifies authenticity, implements plan, coordinates with requester, obtains tools and test equipment, runs jumper, logs on to system, inputs data, verifies input, establishes/changes routing, activates port, logs off system, tests trunk, notifies distant end, turns in tools and test equipment, documents work order, turns in work order, receives log report or documented trouble report, isolates to subsystem, opens trouble ticket, notifies appropriate agency, adjusts or replaces hardware, closes trouble ticket, files trouble ticket; picks up documentation and reviews PMI, quality control check sheet, work card, or Defense Communications

Agency (DCA) Circular for required inspection; notifies technical control or maintenance control of anticipated action, requests equipment release, sets up test equipment, visually inspects equipment; coordinates with appropriate agency, and performs test; observes reading or malfunction, makes minor adjustment, returns equipment to use, and documents problem in maintenance log; assists Quality Control (QC) in performance of technical or special inspection of the work center/work site to identify administrative, managerial or technical problems; and documents action taken.

A3.3.2. **Impact.** +343.986 man-hours (2.141 manpower).

A3.3.3. **Applicability.** This variance applies to those locations with a DMS 100/200 multi-function switch instead of the DMS 100. Use the following man-hour equation instead of the DMS 100 man-hour equation.

Yc = 553.179 + .213175584X
Where "X" equals the LENs count.

A3.4. Title. Positive Technological Variance for Automated Records/Provides Report or Inquiry.

A3.4.1. **Definition.** Receives trouble call, service request, or request for data; tests line, logs on to system, identifies update menu item, selects database, answers prompt, extracts data from file and record, conveys data to requester, enters trouble ticket data, transmits trouble ticket/work order to appropriate maintenance agency, receives trouble ticket back from maintenance agency, enters close-out data, compiles information for work order, selects work order database, enters required data, and logs off system.

A3.4.2. **Impact**. +1 Manpower Authorization.

A3.4.3. **Applicability.** This variance applies to Eielson and Randolph Air Force Bases for the Dial Central Office Management Information System (DCOMIS) system.

A3.5. Title. Positive Mission Variance for MAJCOM Exercise Support.

A3.5.1. **Definition.** Report to and sign in at support processing center by work center personnel. Performs setup, operation, maintenance, and take down of system/equipment used during support.

A3.5.2. **Impact:**

Eielson AFB AK
+ 18.43 man-hours (.115 manpower)

Osan AFB KOR
+425.58 man-hours (2.649 manpower)

Spangdahlem AB GE
+ 10.91 man-hours (.068 manpower)

A3.5.3. **Applicability.** This variance only applies to the above mentioned bases for MAJCOM support.

A3.6. Title. Positive Technological Variance for Private Automatic Exchange (PAX), Private Automatic Branch Exchange (PABX), or Private Branch Exchange (PBX).

A3.6.1. **Definition:**
A3.6.1.1. **Preventive Maintenance.** Receives requirement, reviews listing, initiates documentation, reviews technical data, gathers material, and coordinates with affected agency. Performs operational check, system check, time change, lubrication, corrosion control check, and visual inspection according to technical data. Coordinates equipment restoral; cleans work area; stores tools, material, technical data, and test equipment; defers routine maintenance action; and completes documentation.
A3.6.1.2. **Equipment Repair.** Obtains work order; coordinates with and assists appropriate agency; obtains and reviews applicable directive; obtains test equipment, tools, material, and spare part; prepares work area; and coordinates equipment release. Isolates defect within the system; reviews technical data; identifies defective system equipment, subassembly, or component; and completes documentation. Initiates documentation, performs repair, and verifies serviceability. Coordinates equipment restoral; cleans work area; stores tools, material, technical data, and equipment; defers routine maintenance action; and completes documentation.
A3.6.1.3. **Equipment Modification.** Receives requirement for modification; coordinates with and

assists appropriate agency; obtains and reviews applicable directive; obtains test equipment, tools, material, and spare part; prepares work area; and coordinates equipment release. Receives and proofs Time Compliance Technical Order (TCTO) action, and performs operational check. Coordinates equipment restoral; cleans work area; stores tools, material, technical data and equipment; defers routine maintenance action; and completes documentation. Researches, orders, and completes necessary documentation for a part associated with equipment maintenance action.

A3.6.2. **Impact:**
A3.6.2.1. Electro mechanical (E/M) +92.98 man-hours (.579 manpower) Yc = 92.8X (Where "X" equals the number of (E/M) switches.)
A3.6.2.2. Electronic (ESS) + 22.56 man-hours (.140 manpower) Yc = 22.56X (Where "X" equals the number of (ESS) switches.)

A3.6.3. **Applicability.** This variance applies to those locations which maintain electronic (ESS) or electro mechanical (E/M) PAX, PABX, or PBX exchanges. This does not apply to red/black switch.

A3.7. Title. Positive Mission Variance for Patriot Missile Support.

A3.7.1. **Definition.** Patriot missile support for 1 military space provided by Inter-Service Support Agreement (ISSA) with the Army. Space to be returned to Army upon mission deactivation.

A3.7.2. **Impact.** +1 Manpower Authorization.

A3.7.3. **Applicability.** This variance only applies to Bitburg AFB.

PROCESS ANALYSIS SUMMARY (DMS-100, MSL-100, or GTD-4600)

TELEPHONE SWITCHING SYSTEMS MAINTENANCE - INSIDE PLANT SECTION

PROCESS TITLE	CORE MN-HRS (PAT)	PROJECTED WKLD (FREQ)	FRACT MNPWR
Responds to System Status Alarm	.254	48	.076
Troubleshooting	.123	702	.537
Repair	2.063	64	.822
Monitors Status Panel	.063	24	.010
Updates Database	3.824	13	.309
Prepares Reports	3.734	12	.279
Installation	.618	34	.131
Removal	.396	17	.042
Maintains Manual Records	.108	744	.500
Receives/Ships	.530	18	.0594
Travel	16.756	1	.104
Preventive Maintenance	117.421	1	.731
		Total Fractional Manpower	3.6004